

Appln. No. 09/626,090
Amdt. dated December 8, 2004
Reply to Office Action dated October 19, 2004

Remarks/Arguments

These remarks are in response to the Office Action dated October 19, 2004. This reply is timely filed.

At the time of the Office Action, claims 1-21 were pending in the application. Claims 4, 6, 17, 19 and 21 were objected to as being dependent upon a rejected base claim, but the Examiner has indicated these claims would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 1-3, 7-10, 16, 18 and 20 were rejected under 35 U.S.C. §102(e). Claim 5, and 11-15 were rejected under 35 U.S.C. §103(a). The rejections are set out in more detail below.

I. Allowable Subject Matter

In response to the Examiner's indications regarding claims 4, 6, 17, 19 and 21, those claims have now been rewritten in independent form to include all of the limitations of the base claim and any intervening claims. Accordingly, claims 4, 6, 17, 19 and 21 are now believed to be in condition for allowance. As the dependency of the claims have changed, please charge deposit account 50-2884 in the amount necessary.

II. Brief Review of Applicants' Invention

Prior to addressing the Examiner's rejections on the art, a brief review of applicants' invention is appropriate. The invention relates to a method and apparatus for using a conductive fluid to control certain electrical characteristics of a horn antenna. According to amended claim 1, the process can include the step of selectively changing a volume or a location of a conductive fluid contained within at least one cavity having a fixed position within the horn antenna to cause a change in the electrical characteristics of the horn. The volume and location of the conductive fluid contained in the at least one cavity can be controlled using a series of one or more valves, pumps, actuators, conduits and sensors. Similarly, claim 10 recites an electromagnetic horn antenna that has at least one fixed cavity structure defined within the horn housing. The cavity structure is at least partially formed of a dielectric material. A conductive fluid and a fluid control system are also provided. The fluid control system selectively varies the volume of the

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conductive fluid contained within the fixed position cavity structure for dynamically modifying one or more electrical characteristic of the horn.

III. Rejections on Art

Claims 1-3, 7-10, 16, 18 and 20 were rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Pub. No. 2004/0130497 to Alexeff, et al. (hereinafter "Alexeff et al."). Alexeff et al. discloses a horn antenna in Figs. 4 and 5 which uses a fluid filled bulb. Alexeff et al., ¶ [0023]. When the fluid bulbs are energized, the fluid contained therein forms a conductive plasma. Accordingly, the horn can be reconfigured by energizing or de-energizing the fluid. From the foregoing, it is apparent that Figs 4 and 5 of Alexeff et al. relate to a system that controls an electrical characteristic of a horn antenna by applying electrical energy to energize a non-conductive fluid so that it becomes conductive. Alexeff et al. does not control an electrical characteristic by changing the volume or location of the fluid within the bulb. In contrast, Applicants' amended claims 1 and 10 recite a system in which an electrical characteristic of a horn antenna is controlled by changing a volume or location of conductive fluid contained within a fixed cavity of the horn. Alexeff et al. does not disclose this feature.

In forming the foregoing rejection, Applicant notes that the Examiner also makes reference to Alexeff et al., ¶ [0029]. That paragraph concerns an antenna array system wherein a plurality of antenna elements 112a-d are coupled to a signal generator/receiver through a plurality of the fluid filled bulbs described above. The fluid filled bulbs can be individually energized to form a plasma, thereby coupling the individual antenna elements to the signal generator/receiver device. Notably, Alexeff et al. states that the antenna elements can themselves be plasma elements or conductive fluid elements. Alexeff et al., ¶ [0029]. However, Alexeff et al. does not disclose or suggest that a volume of conductive fluid contained in the array elements could be selectively varied to control an electrical characteristic of a horn antenna. Similarly, Alexeff et al. does not disclose or suggest that a location of the conductive fluid within the bulb could be varied to control the electrical characteristics of a horn antenna. In view of the foregoing, Applicants respectfully submit that claims 1-3, 7-10, 16, 18 and 20 are not anticipated by Alexeff, et al.

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Regarding claims 2, 3, 7, 9, 18 and 20, the Examiner contends that Alexeff et al. shows the claimed features in Figs. 4, 5; and ¶ [0023]. As noted above however, the discussion relating to Figs. 4 and 5 of Alexeff et al. only describe a horn antenna that uses a non-conductive fluid to control an electrical characteristic of a horn by being made conductive by application of electrical energy. With regard to horn antennas, Alexeff et al. only discloses that the length of the horn can be reconfigured by decoupling a portion of the horn antenna. Alexeff et al. does not disclose varying a profile of a conductive surface of a horn antenna as recited in claim 2. Likewise, with regard to claim 9, Alexeff et al. does not disclose that a system valves, pumps, and fluid actuators can be used to control a position of conductive fluid within at least one cavity fixed within the horn. The remaining claims 3, 7, 18, and 20 are believed to be allowable at least by virtue of their dependence upon an allowable base claim. Regarding claims 8 and 16, such claims are also believed to be allowable by virtue of their dependence upon allowable base claim.

Claim 5 was rejected under 35 U.S.C. §103(a) as being unpatentable over Alexeff, et al. According to the Examiner, Alexeff does not disclose providing a fluid filled bulb around the throat region for changing at least one internal dimension of the throat region. However, the Examiner considers this feature to be obvious in light of Alexeff et al. Claims 11-15 were rejected under §103(a) as being unpatentable over Alexeff, et al, in view of U.S. Patent No. 6,396,453 to Amyotte, which shows a corrugated horn antenna for improved pattern symmetry and wider bandwidth. In response to these rejections, Applicants submit that Amyotte does not disclose that the ribs of a corrugated horn antenna can be used to form cavities for conductive fluid as recited in claim 12. Similarly, Amyotte does not disclose that the ribs can be formed of a dielectric material as recited in claim 14. Claims 5 and 11-15 are also believed to be allowable at least because of their dependence on an allowable base claim.

IV. Conclusion

Applicant has made every effort to present claims which distinguish over the prior art, and it is believed that all claims are in condition for allowance. Nevertheless, Applicant invites the Examiner to call the undersigned if it is believed that a telephonic

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interview would expedite the prosecution of the application to an allowance. In view of the foregoing remarks, Applicant respectfully requests reconsideration and prompt allowance of the pending claims.

Respectfully submitted,

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Date


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